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ABSTRACT

LCDF (Library Collection Distribution Formulas) is a modular, interactive, user-friendly applications and instructional software package designed to help librarians determine the placement and calculate the distribution of book collections and book sequences in a library, prior to physical collection movement. LCDF is written in UCSD (University of California at San Diego) Standard Pascal and will run on any mainframe or microcomputer with a Pascal compiler or a P-system (P-code interpreter). The package's four modules are used to enter data for current and new book stack shelf configurations, to perform a feasibility of options study, and to calculate collection sequence placement. There is also the capability of automatic charting and revision of charted data. Program documentation is self-contained and can be accessed online or printed at the user's option. The program was validated by comparison with the manual calculations made prior to the movement of a 683,000-volume academic library. The advantages of using LCDF include its ability to save time, produce accurate results, and provide printed copies of charts and calculation results. This thesis describes the development and evaluation of LCDF and presents a draft version of the LCDF user manual, a sample run of the LCDF program, sample results, and a 10-item bibliography. (ESR)

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The Development of a Computer-based Library System:

LCDF - Library Collection Distribution Formulas

by

Donna Lee Kurkul

A seminar paper

submitted in partial fulfillment

of the requirements for the degree of

Master in Library Science

The School of Library and Information Science

The State University of New York at Albany

December 1982

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The Development of a Computer-based Library System:

LCDF - Library Collection Distribution Formulas

ABSTRACT

Program LCDF, Library Collection Distribution Formulas, is the result of a project to determine the feasibility of computer-assisted collection movement planning. Listed are some of the steps taken to initiate and complete the development of this computer-based library system: system analysis; general, functional, work, and performance requirements; and design specifications--to name a few.

The software, LCDF, is a modular, interactive, user-friendly applications and instructional package designed by a collection movement manager for librarians to plan collection placement and distribution and for students to learn one method of determining such prior to physical collection movement.

LCDF is written in UCSD Standard Pascal for use on mainframe or microcomputers. The Pascal compiler and P-system (P-code interpreter) functions are described as they relate to running the LCDF program.

Program documentation is self-contained: the user manual and reference/index are program integrated and accessible at the user's option; the user may also choose to print the documentation. A summary of commands facilitates the easy use of the menu of operations.

The effectiveness of the program's capability and applicability has been validated to implement the same methodology and to produce the same results obtained manually for planning the collection placement and distribution of an academic library's 682,810 volumes prior to its movement.

The efficiency of the program's dynamics are obvious. The computer

can instantly and infallibly produce and record results to calculations requiring at least ten to fifteen minutes to manually perform, verify, and record. The program's capability for automatic charting and revision of charted data eliminates both format and typing time for the planner. The printed copy of charts and calculation results standardize data for more effective presentation.

--Donna Lee Kurkul

The Development of a Computer-based Library System:

LCDF - Library Collection Distribution Formulas

- presented by -

Donna Lee Kurkul

- in memory of -

Sally Waring

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A Note of Thanks

I wish to thank Marielouise A. Hooper, Smith College, class of 1983. Without her effort this program, LCDF, would not have been created. Marielouise, representing the first graduating class in Computer Science at Smith, is a credit to both the College and the Department.

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PROGRAM

LCDF - Library Collection Distribution Formulas

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Library Collection Distribution Formulas: devised by

Donna Lee Kurkul

User Manual and Reference Index: written by

Donna Lee Kurkul

Project Manager: Donna Lee Kurkul

Program: written by Marielouise A. Hooper

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Donna Lee Kurkul
18 Webster St.
Amherst, MA 01002

Proposal for project in the Information Environment Seminar:

"The feasibility of computer-assisted collection movement planning"

Purpose

To write a program (Pascal & P-code modification) functional for my seven algebraic formulas for calculating collection space-growth-capacity, collection sequence distribution, etc.

To compare the time requirements of computer-assisted collection movement planning, given the formulas, with that of manual analysis of data calculations.

Results

The end-product will be a program, a user manual, and a floppy disk available for use in collection movement planning; the actual formulas will ultimately be copyrighted when the article on this research is published. The program will be compatible with micro-computers, etc.

Method of study

I will be independently tutored in the Pascal language by the assistant to the Computer Center at Smith College. Fortunately, the terminals and other hardware are located in the William Allan Neilson Library where I work.

The efficiency and effectiveness of the program's capability will be established by a comparison of its results with the already proven use of the formulas and records acquired to date.

STUDENT WANTED: INDEPENDENT JOB

JOB: Write a program and produce printout results.
Apply Easygraph for charts and floor plans.

FOR: Donna Lee Kurkul, Administrative Assistant and Stack Supervisor
x501 or x623 Neilson Library, Circulation Department

Summary of Job Description:

Write a program applicable for the statistical analysis of library data to be used in the mathematical formulas to be provided.

Use Easygraph to chart data and profile data on floor plans.

WORK SCHEDULE: Set your own, but the project must be completed on or before October 15, 1982.

WAGE: $3.35 per hour

ESTIMATED TIME FOR PROJECT COMPLETION NOT TO EXCEED 20 HOURS, TOTAL.

STUDENT WILL WORK DIRECTLY WITH SPONSOR AS NEEDED, AND HOURS ARRANGED.

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The Development of an Applications and Instructional Software Package Validating the Feasibility of Computer-assisted Collection Movement Planning

The research and product contained and described herein were conceived in the idea to analyze the feasibility of computer-assisted collection movement planning. Following seven years of planning, supervising, and implementing collection relocation, collection movement appears to be my forte. Planning the final locations and movements of the total 682,810-volume collection of the William Allan Neilson Library, Smith College, Northampton, Massachusetts, fostered my development of mathematical formulas the application of which proved effective for space and sequence distributions of book collections at Neilson Library.

The formulas were deduced during many man-hours of trial-and-error calculation to determine the placement and distribution of the collections and collection sequences prior to movement. In the event of planning future library collection placement and distribution, computerizing the procedures and formulas would inevitably economize both time and labor.

Certainly, it was feasible to program function-specific algebraic formulas to duplicate answers manually calculated. Library operations like cataloguing, reference, and circulation have, to a degree, been adapted to automation to effect more efficient service. Then, why not automate procedures and calculations for collection placement and distribution to assist the task in collection movement planning?

Following, are the steps taken to initiate and complete the development of this computer-based library system:

1. Project definition--defining the nature, purpose, and method of study for project (Seminar proposal)
2. Job definition--defining job for job description to recruit programmer-tutor (Job description)
3. Recruitment--interview prospective programmer-tutor candidates for their skill, knowledge, ability, and motivation to satisfy job requirements
4. Plan for project completion--establish maximum time limit to develop, create, and test the program
5. Analysis of existing system--study current manual procedures and calculations for library collection distribution formulas
6. Goals of new system--study translation of manual procedures and calculations for adaptation in automated format for applications and instructions
7. Development of set of requirements--

   General--determine programming language to use
   determine program structure
   determine program format: floppy disk
   determine user manual medium: program integrated
   determine nature of user/audience
   determine operating capability for hardware

   Functional--adapt program for use on microcomputers and mainframe computers
   simplify construct accessibility to user's advantage: create menu of operations
   offer optional storage of data in external files for retrieval in printed hard copy

adapt charts for any library's needs

assure storage of all charts created and calculations performed

maintain consistency in text and program format

provide for selection at user's option:

description of each menu operation function

example for screen display

explanation of example for screen display

instructions for each operation

Work and performance requirements (Documentation)--

test program with trial run

debug program

modify program as needed

produce sample run of program

produce copy of external file for charts produced in sample run of program

produce copy of external file for calculation results produced in sample run

validate program through actual application

produce copy of user manual with built-in reference section

generate index to access program content

Computer applications specialist's design specifications--

the modular approach

input/output specifications

processing specifications

data base specifications

other design specifications

integrate documentation

Systems Analysis Justifying Goals of New System

Planning and management of physical library collections are vital to library operations, and has recently surfaced as one of the specific services offered to libraries by various consultant groups, nationwide. As physical book collections grow and libraries expand their building capacities, there is a call for the expertise in physical book moving and calculating physical library collection placement and distribution. This trend has influenced the development of this software for determining collection placement and collection sequence distribution within libraries. This trend has also influenced the nature of the audience for whom the software is intended for use. The LCDF (Library Collection Distribution Formulas) program is a modular, interactive, user-friendly applications and instructional package designed by a collection movement manager for collection movement planners and students interested in learning one method of determining collection placement and distribution.

"Crucial considerations are the Operating system required to run the package, the format of the disks used by the system, and the ease with which the program can be learned by those who will be using it" (Blair, 1982b, p. 69). More specifically, would the library collection movement manager have access to a computer? Would the student be using a micro? The ideal software should be compatible with specific systems of hardware. If not compatible, what module would be needed to tailor the software to a system? Answers to these questions were also influenced by the language of the program, UCSD Standard Pascal. UCSD is a highly

structured programming language which will run on any system with a Pascal compiler or P-system. Running the program through the P-system for micros will produce a P-code version of the program which in turn is executed by microcomputers with the P-system or P-code interpreter. The program is also available on a floppy disk compatible for use on an Apple microcomputer. The LCDF program has been written for use on a mainframe computer or for use on a micro. Future manufacturing and marketing specifications would ideally be tailor-made for the system hardware on site. This entails direct communication between manufacturer/vendor and the purchaser/user. Why not provide a double-sided disk if that is what is needed? Especially when the number of purchaser/users is confined to a specific group for a specific need. The details on manufacturing and marketing, such as disk format, purchase price, etc., have yet to be formalized.

One design specification for the program was that it be modular: if you know the concepts, the program is usable. The program, then, is menu driven. Analysing the system of procedures to calculate collection placement and sequence distribution established that each procedure could be outlined for a set of operations to be performed, or a menu of operations. Programmed within the appropriate operations are the formulas for the operations generating answers assisting the decision of what collection should be placed where in your library; determining the percentage of growth space for the collection in whole or parts; and determining the number of inches to fill per shelf per sequence per area.

To create the optimum user-friendly software, it is ideal to integrate the user-manual into the program. "Any lack of human/computer bliss is often due to the documentation of both hardware and software

(the manuals)" (Blair, 1982c, p. 84). Function-specific application and instruction has been implemented with each operation. Located after each menu operation are an operational description, an example for screen display, an explanation of the example, tutorial assistance, and instructions for the operation. The user can be guided through the session by the informational assistance integral to the program. However, the user can optionally indicate by yes or no, the desire to view or not view the descriptions, or the examples, or the explanations, or the instructions. The user can ascertain information at will without consulting a second source. In addition, the summary of commands and reference index, both on-screen and in print, extend user facility of the program.

Program implementation ideally seeks limitation to the number of external files used; the more external files required to run a program, the more fragmented the program becomes. The user manual presented itself for a decision to fragment or to integrate. Editing the user manual or updating it is much easier when it is externally filed, and not program-integrated. However, a very complex algorithm is required to extract the user manual from the external file. Incorporation of the user manual within the program requires hundreds of input/output statements, and editing, though feasible, is more difficult than for the external file. As created, the program runs without external files and has a program-integrated user manual. It matters little to the user who sees the same on the screen; the user is seldom concerned with program intricacies, as long as the program functions well. However, this is one example of dilemmas confronted by computer applications specialists (program designers) in software development.

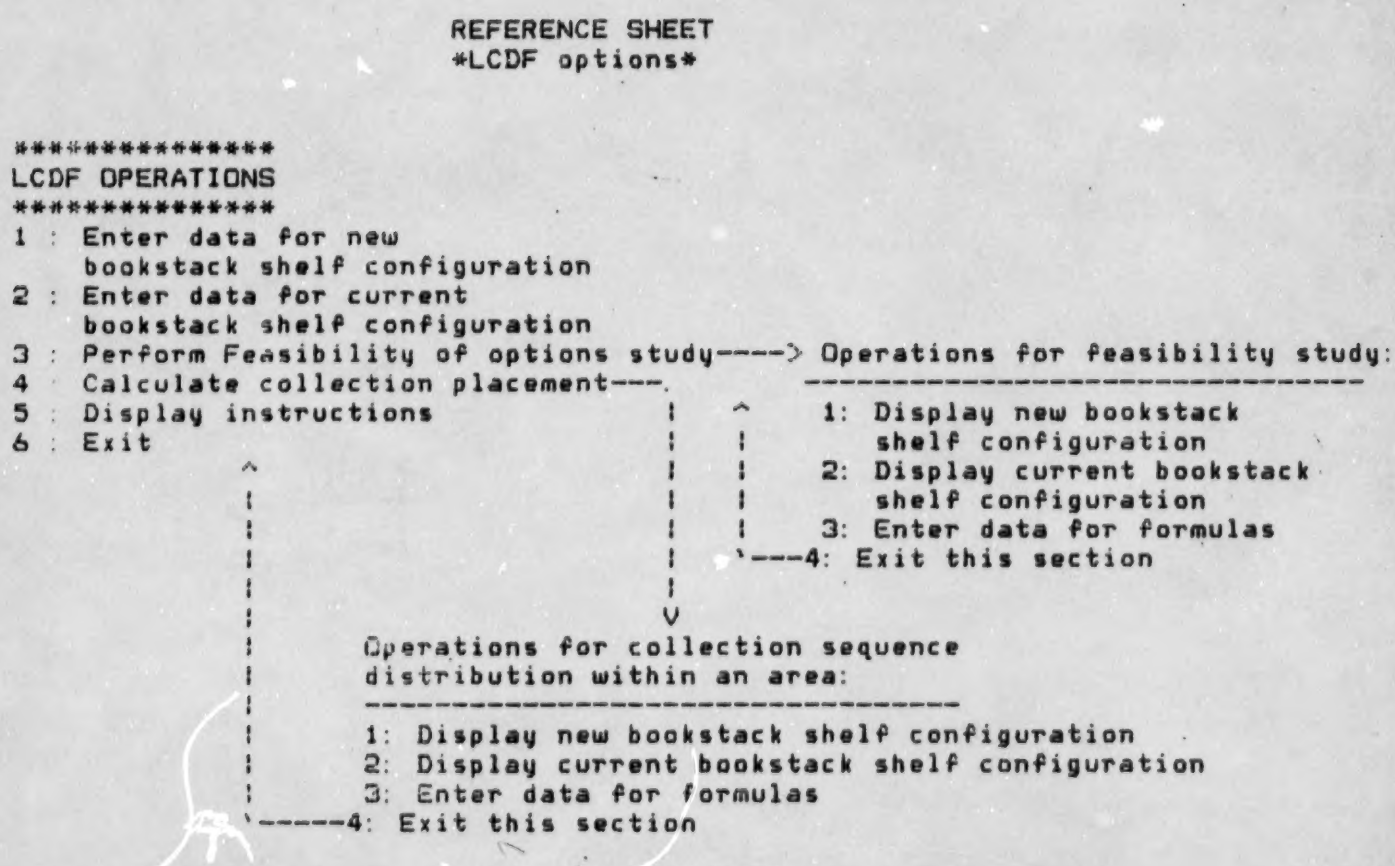
One must also consider the problem with screen readability versus that of printed matter. Reading either a screen or printed matter will, over extended periods, strain the eyes. To reduce user frustration and facilitate ease in readability and use of the program, all descriptions of operations, examples and explanations, and instructions were limited to a couple of sentences comprising short paragraphs. Constructs are thus unfragmented and visibly viewed as independent statements integral to the whole. This structure also augments the creation and utility of the accompanying reference-index portion of the program. The reference-index to the program can be retrieved on screen or via printout. The program will also produce printed copy of the user manual. Although the user manual and the reference index could be manufactured and distributed in hard copy along with the program, it seemed advantageous to the user to print out his own copies if desired; the program includes such capability.

The program organization, as shown in Table 1, corresponds directly to how the program is written, but also reflects a flow of control. Each menu operation, which may be independently accessed, offers within itself descriptions, examples, explanations, instructions, and the operation to perform; each of the latter access points may also be selected at will. The commands are yes, no, and type in numbers.

The language, UCSD--University of California at San Diego Standard Pascal--adapts itself well to the nature of the construct being programmed. The procedures for determining the placement and calculating the distribution of book collections and collection sequences in a library, prior to physical book movement, involve compilation of data into charts and data input for program computation. Although the charts in all likelihood will

TABLE 1

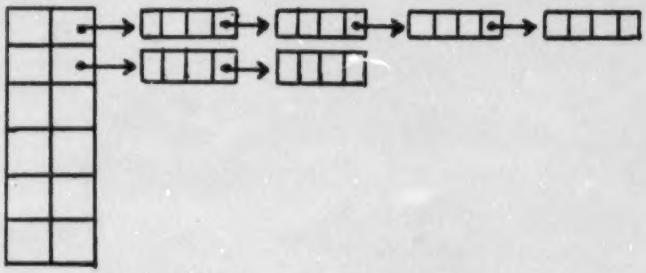
REFERENCE SHEET
LCDF options


****
LCDF OPERATIONS
****
1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit
Operations for feasibility study:
1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section
Operations for collection sequence distribution within an area:
1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

always contain real numbers to indicate the numbers of available and occupied shelves, the algebraic formulas require integers to represent true percentages and decimals. BASIC could hardly fulfill this need; Pascal could. Pascal also allowed the use of natural language, important in a program involving technical explication.

Pascal is also adaptable to the nature of creating charts, as well as for steps to be performed within operations. The program structure is dynamic for it features link lists (area lists); see link list concept diagram following. A library with as many as twenty-five floors can chart or list for any number of areas on the floors, its numbers for available or occupied shelves per area. The user can also designate the type of collection or span of call number sequences for the areas by simply typing in the name or sequence. This flexibility is to the user's and to the library's advantage.

Link List Concept
(An area within an area within an area)



The program, then, permits individual compiling of data into charts, available both on-screen and in printed form. Each chart, the new book stack shelf configuration and the current book stack shelf configuration, can be stored for printed copy if the user indicates yes, when asked,

Do you wish to store this information? Such provisional queries guide the user throughout the session. If the user desires to bypass the operational description, example, and explanation to obtain the instructions for the operation, he merely indicates with a no, until he arrives at the option for instructions. Using the program and understanding its mechanics are simple. The instructional examples are logically written and derive from actual circumstances encountered in determining collection placement and distribution. The program makes no assumptions about the user: Sure, you have floor plans indicating the book stack layout; but do they reflect the actual book stack installation? Do you know how to figure numbers of available or numbers of occupied shelves? If not, the integrated user manual provides additional tutorial assistance. Hopefully, the many instructional hints will eliminate the painstaking process of preplanning for collection movement. The LCDF program was tailored by and for a user, and meant to apply to any combination of problems in a variety of libraries.

To fulfill its mission, the LCDF program had to be validated for its effectiveness and efficiency. Prior to the program development, all calculations and procedures for collection placement and distribution had been manually performed with the assistance of a calculator or adding machine. A prose analysis and in-depth explanation of those calculations and procedures pre-exist in research entitled "The Methodology, Logistics, and Time/Cost Study of the Planning, Implementation, and Movement of an Academic Library Collection" (Kurkul, 1982a). The LCDF program is an automated extrapolation of those principles already established. The research mentioned is descriptive and passive, whereas the program is function-specific and active.

A quick examination of Appendix II, extracted from the pre-existing research, exhibits that the collection movement planner or student in collection movement planning is provided with examples of problems and problem analysis to instruct the basic algebraic principles, in order to apply the formulas. The LCDF program, on the other hand, with intrinsic computation capability exempts the user from mathematical reasoning requirements. In lieu of doing the calculation, the user of the LCDF program needs only know how to count and enter the variables, or figures, to determine answers to the same questions posed in Appendix II (Table 2). Only a few peripheral program instructions for operations necessitate manual determination of numbers for available and for occupied shelves; in these instances a pad, pencil, and calculator suffice. The LCDF program is computer based by definition since all procedures cannot be computerized; the most difficult calculations are computerized, and thus a timesaver. Table 3 shows a sample run for the identical answers to those calculations displayed in Table 2. Eliminating the math element and obtaining instant results are obviously preferable.

Table 4 also is extracted from the pre-existing research. The chart for the total numbers of available shelves of a library's renovated areas and newly constructed additions, into which the collection would be fully redistributed for placement, represents its final form; there had been dozens of revisions and typewritten drafts preceding the draft in Table 4, which reflects the actual numbers of book stack shelves after physical book stack installation. Table 5 provides the same data but in its computerized form. The difference between the two charts is that Table 4 represents a horizontal form and Table 5 a vertical form. The manually produced chart requires auxiliary additions of numbers by the

TABLE 2

APPENDIX II

Formula 1

Problem: A library's collection comprises several collection types, e.g., Dewey Decimal classed books, Library of Congress monographs, etc., each of which must be considered for placement on different floors and areas of a renovated library with newly constructed additions to the building. Given the collections, each represented by the number of shelves they occupy, what areas under consideration will make the most efficient use of space to be occupied? What percentage of that space would be occupied?

Let a = # of shelves occupied

b = # of shelves to be occupied

x = % of space to be occupied in area under consideration

Therefore--

$\frac{a}{b} = x$; If $x = \frac{x}{100}$, then $\frac{a}{b} = \frac{x}{100}$ and $\frac{a}{b} \times \frac{100}{1} = \frac{x}{100} \times \frac{100}{1}$

and $\frac{a \times 100}{b} = x$.

Replacing the letter symbols with the number of shelves they represent in formula 1, as given in text on page for feasibility of options study 1, it follows:

(a) $\frac{11,989 \times 100}{17,801}$ = 67.35% of space occupied for Dewey collection

and

(b) $\frac{4,334 \times 100}{9,121}$ = 47.5% of space occupied for LC collection

Formula 2

Problem: If the Dewey collection was to be placed in the area under consideration used in formula 1, how many inches must be ideally filled per 35-inch shelf in order that all shelves are occupied with some books? How many inches would be ideally filled for the LC collection to be distributed throughout the area under consideration and used in formula 1?

Let n = number for percentage, and x = inches to fill per shelf,

then $\frac{n \times 35}{100} = x$.

Given the percentages of space occupied (answers from formula 1), 67.35% for Dewey and 47.5 for LC, then:

$\frac{67.35 \times 35}{100} = x$ OR x = 23.5725 inches to fill per shelf of Dewey

and

$\frac{47.5 \times 35}{100} = x$ OR x = 16.625 inches to fill per shelf of LC

If percentage conversion is used, the formula is:

$$\% \times 35 = x$$

Example: $67.35\% = \frac{67.35}{100}$ or .6735

and $.6735 \times 35 = x$ or 23.5725

Answer Analysis

For the examples given in use of formulas 1 and 2, it was shown that the Dewey collection, if put into the area under consideration, would occupy only 67.35 percent of total available space; to occupy the other (100 - 67.35 = 32.65) near 33 percent, 23.5 inches per shelf would be filled if books were distributed to occupy 67.35 percent of space on each shelf. The latter would entail spreading out a closed, nongrowing or shrinking collection.

Since all shelves are 35 inches wide, the shelves for the LC collection would be just less than half full, enough growth space for about four years. Moving the entire collection in another five years would defeat the purpose in building expansion. A repetition of equations for each optional placement of collection types will answer what collection, given its characteristics, will be more suitably housed in areas under consideration.

TABLE 3

RESULTS FROM PROGRAMMED CALCULATIONS

The formulas used for the problems given in Table 2 displayed in computerized answer form after entry of identical data as used in Appendix II (Table 2)--the formulas manually applied to the problems given in Table 2 are not viewed by the user of program LCDF. Instead, the user sees the following screen display of results which duplicate those displayed in Table 2.

```
Number of shelves occupied by collection/sequence> 11989
Number of shelves available in area/subarea> 17801
Length of shelves in inches - standard shelves are 36 inches
long, 35 inches of usable space> 35

  ***** 67.35% of the shelves would be occupied *****
  ***** 23.57 inches per shelf would be filled *****
```

```
Number of shelves occupied by collection/sequence> 4334
Number of shelves available in area/subarea> 9121
Length of shelves in inches - standard shelves are 36 inches
long, 35 inches of usable space> 35

  ***** 47.52% of the shelves would be occupied *****
  ***** 16.63 inches per shelf would be filled *****
```

TABLE 2

COUNTS OF AVAILABLE BOOK-STACK SHELVES
POST-CONSTRUCTION/RENOVATION

Area	Level B		Level A		Level 1	Level 2	Level 3	Level 4	Total
South addition	0		1,932	(1,320)	0	2,940	1,036	0	5,908
South pavilion	1,701	(1,160)*	0		0	1,295	1,715	0	4,711
West pavilion	2,604	(1,801)	2,282	(1,570)	0	0	2,828	1,764	9,478
Core pavilion	1,260	(900)	1,260		0	616	0	728	3,864
North pavilion	1,946	(1,390)	1,946	(1,390)	0	1,792	1,946	1,946	9,576
North addition	1,792	(1,180)	1,792	(1,180)	0	1,792	1,596	0	6,972
Total	9,303		9,212		0	8,435	9,121	4,438	40,509

*Parenthesized counts are standardized at 5 shelves per section; all other counts are standardized at 7 shelves per section.

TABLE 4

TABLE 5

COUNTS OF BOOKSTACK SHELVES

AREA	Shelves per area	SUBAREA	Shelves per subarea	COLLECTION
1	5908	1	0	
1	5908	2	1932	
1	5908	3	0	
1	5908	4	2940	
1	5908	5	1036	
1	5908	6	0	
2	4711	1	1701	
2	4711	2	0	
2	4711	3	0	
2	4711	4	1295	
2	4711	5	1715	
2	4711	6	0	
3	9478	1	2604	
3	9478	2	2282	
3	9478	3	0	
3	9478	4	0	
3	9478	5	2828	
3	9478	6	1764	
4	3864	1	1260	
4	3864	2	1260	
4	3864	3	0	
4	3864	4	616	
4	3864	5	0	
4	3864	6	728	
5	9576	1	1946	
5	9576	2	1946	
5	9576	3	0	
5	9576	4	1792	
5	9576	5	1946	
5	9576	6	1946	
6	6972	1	1792	
6	6972	2	1792	
6	6972	3	0	
6	6972	4	1792	
6	6972	5	1596	
6	6972	6	0	

chart compiler; the LCDF chart automatically adds the totals when the user has completed the chart via the same keyboard as a typewriter. You could say that the chart format, the typing, and the adding have been combined into one step. Each manual operation for the calculations and procedures for collection placement and distribution were so compared with each menu operation; there was no variation in results, except that performing the calculations and procedures to obtain results required only a fraction of the time as when performed manually.

The efficiency of the program's dynamics are obvious. The computer can instantly and infallibly produce and record results to calculations which would require at least fifteen minutes each to manually perform, verify, and record. The program's capability for automatic charting and revision of charted data eliminates both format and typing time for the planner. The printed copy of charts and calculation results standardize data for more effective and rapid presentation. When collection movement managers are hard-pressed for time and must quickly calculate for certain determinations, the LCDF program could very well be an asset. No program, as such, for collection premovement placement and distribution exists. Regardless of the method chosen to move a library collection(s), there will always be someone behind the scenes or upfront who has determined where and why some portions or the whole of a collection is moving. The LCDF program is well suited to libraries that renovate, add new additions to existing structures, or build new facilities. A survey (Kurkul, 1982a) tangentially related to the previously mentioned research (Kurkul, 1982b) determined that all of the respondents from medium-sized academic libraries move their collections, or parts thereof, at least annually. Literature

documenting the numbers of libraries that renovate, add, or rebuild, establishes that collection movement planning is central to library management. Whatever the reason for collection movement, and whatever the library, there are some basic principles provided in the LCDF program, which are applicable to many sizes and types of libraries, and types of collections. It is meant to accommodate the largest and most complex library buildings and their collections, as well as the smallest. There is no ideal system for any purpose, but the LCDF proposes one method, in hopes of satisfying the many librarians struggling to determine means of calculating collection placement and distribution. Perhaps, someday in the future, this program, combined with an automated circulation system, will provide the most accurate picture of space used and space needed.

LCDF - LIBRARY COLLECTION DISTRIBUTION FORMULAS

SAMPLE RUN OF PROGRAM

```
  RUN LCDF
Welcome to the LCDF program!

Do you wish to see a description of this program? N


**************
LCDF OPERATIONS
**************

1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit


Please enter number> 1
New book stack shelf configuration:
Do you wish to see a description? N
Do you wish to see example for screen display? N
Do you wish to see instructions for this operation? N
**************************

Enter number of areas> 2
Enter number of subareas> 2
Enter number of shelves in following chart

..Area.....Subarea.....NUMBER OF SHELVES
   1            1            1000

   1            2            500


   2            1            1000

   2            2            0


Do you wish to see the chart? (Y or N)> Y


****    ********    *******    ************    ***************
          Shelves                  Shelves
AREA    per area    SUBAREA    per subarea      COLLECTION
****    ********    *******    ************    ***************

   1        1500          1          1000
   1        1500          2           500
   2        1000          1          1000
   2        1000          2             0

Do you wish to store this information? ( Y or N )> Y
All charts will be stored together in an external
file called AWAY.
```

```
***************
LCDF OPERATIONS
***************

1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit


Please enter number> 2
Current book stack shelf configuration:
Do you wish to see a description? N
Do you wish to see example for screen display? N
Do you wish to see instructions for this operation? N
Please enter number of collections/sequences> 3
  < Collection names can be up to
    15 characters long - use the corresponding key
    to refer to a collection. >


KEY       Collection (or sequence)
-----------------------------------
 1          DDC 800-899
 2          000-799/900-999
 3          REF/PER/NWSPR

****************************

Enter number of areas> 2
Enter number of subareas> 2
Enter number of shelves in following chart

..Area....Subarea....NUMBER OF SHELVES
   1          1          500
Collection Key = 1

   1          2          100
Collection Key = 3


   2          1          500
Collection Key = 2

   2          2          0
Collection Key = 4


Do you wish to see the chart? (Y or N)> Y
```

```
****    ********    *******   ***********   **************
          Shelves                Shelves
AREA    per area    SUBAREA   per subarea     COLLECTION
****    ********    *******   ***********   **************

   1         600          1           500   DDC 800-899
   1         600          2           100   REF/PER/NWSPR
   2         500          1           500   000-799/900-999
   2         500          2             0

Do you wish to store this information? ( Y or N )> Y
All charts will be stored together in an external
file called AWAY.


***************
LCDF OPERATIONS
***************

1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit

Please enter number> 3
Feasibility of options study:
Do you wish to see a description? N
Do you wish to see an example for screen display? N
Do you wish to see instructions for feasibility of options study? N
Do you wish to see instructions for this operation? N

Operations for feasibility study
--------------------------------
1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 3

Number of shelves occupied by collection/sequence> 11989
Number of shelves available in area/subarea> 17801
Length of shelves in inches - standard shelves are 36 inches
long; 35 inches of usable space> 35

  ***** 67.35% of the shelves would be occupied *****


  ***** 32.65% of the shelves would be unoccupied *****
  ***** 23.57 inches per shelf would be filled *****
```

```
Operations for feasibility study
--------------------------------

1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 3

Number of shelves occupied by collection/sequence> 4334
Number of shelves available in area/subarea> 9129
Length of shelves in inches - standard shelves are 36 inches
long, 35 inches of usable space> 35

  ***** 47.48% of the shelves would be occupied *****
  ***** 52.52% of the shelves would be unoccupied *****
  ***** 16.62 inches per shelf would be filled *****
```

```
Operations for feasibility study
--------------------------------

1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 1
```

****	********	*******	**********	**************
AREA	Shelves per area	SUBAREA	Shelves per subarea	COLLECTION
****	********	*******	**********	**************
1	1500	1	1000	
1	1500	2	500	
2	1000	1	1000	
2	1000	2	0	

```
Operations for feasibility study
--------------------------------

1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 2
```

AREA	Shelves per area	SUBAREA	Shelves per subarea	COLLECTION
1	600	1	500	DDC 800-899
1	600	2	100	REF/PER/NWSPR
2	500	1	500	000-799/900-999
2	500	2	0	

```
Operations for feasibility study
--------------------------------

1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 4
```

```
**********
USER OPERATIONS
**********

1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit

Please enter number> 4
Calculating collection sequence placement:

Do you wish to see a description? N
-------------------------------------------------------------------
Operations for collection sequence distribution within an area
-------------------------------------------------------------------

1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 3

*******
STEP 1:
*******
Do you wish to see an example? 1701\1071\N
Do you wish to see instructions for calculating collection
sequence placement - step 1? (Y or N) N
Do you wish to see instructions for operation? N
*Determine ideal percentage of shelf space to be occupied in
          an area or subarea by a collection*

Number of available shelves in an area> 1701
Total number of shelves into which collection is going> 17355


  ***   9.80% of the collection will occupy the subarea ***
  ***   9.80% of the total shelf space will be used ***


*Determine ideal number of shelves which should be filled in an area*
Enter total number of shelves occupied by collection> 4334

  *** 421.72 shelves of the 1701 shelves of the area should be ideally filled *
```

```
******
STEP 2:
******
Do you wish to see example? N
Do you wish to see instructions to count actual number of
shelves for distribution of sequences into areas? N
Do you wish to see instructions to obtain the actual number
of inches to fill per shelf per area? N
Do you wish to see instructions for operation - step 2? N
*Determine actual percent of growth space for the sequence
                going into the area*

Enter number of actual shelves occupied by sequence division> 494

   *** The growth space for this sequence is  70.96% ***


*Determine the number of inches to fill per shelf for
          sequence going into area*


Number of inches occupied by sequence going into the area> 15080
Number of shelves per area (this may be an amended count)> 1160

   *** 13.00 inches per shelf should be filled ***


Do you want to revise the new bookstack shelf chart?
Enter Y or N > N
```

Operations for collection sequence distribution within an area

---

```
1: Display new bookstack shelf configuration
2: Display current bookstack shelf configuration
3: Enter data for formulas
4: Exit this section

Enter operation> 4
```

```
LIST OPERATIONS

1 : Enter data for new bookstack shelf configuration
2 : Enter data for current bookstack shelf configuration
3 : Perform Feasibility of options study
4 : Calculate collection placement
5 : Display instructions
6 : Exit

Please enter number> 6
Thank you ...
$
```

SAMPLE RESULTS (PRINTOUT)

```
OPTION:
------------------------------
Shelves occupied by collection = 11989
Shelves available in area =  17801
Length of shelves in inches =  35.00

  ***** 67.35% of the shelves would be occupied *****

  ***** 32.65% of the shelves would be unoccupied *****
  ***** 23.57 inches per shelf would be filled *****
------------------------------
OPTION:
------------------------------
Shelves occupied by collection =  4334
Shelves available in area =  9129
Length of shelves in inches =  35.00

  ***** 47.48% of the shelves would be occupied *****

  ***** 52.52% of the shelves would be unoccupied *****
  ***** 16.62 inches per shelf would be filled *****
------------------------------

------------------------------
Moving the collection: STEP 1
------------------------------

Available shelves in an area =       1701
Shelves into which collection is going =      17355

  ***   9.80% of the collection will occupy the subarea ***
  ***   9.80% of the total shelf space will be used ***


Shelves occupied by collection =       4334

  *** 424.78 shelves of the 1701 shelves of the area should be ideally filled

STEP 2:

Shelves occupied by sequence =        494

  *** The growth space for this sequence is  70.96% ***


Inches occupied by sequence =  15080.00
Shelves per area =       1160
  *** 13.00 inches per shelf should be filled ***
```

LCDF - Library Collection Distribution Formulas

User Manual

DRAFT 1

LCDF - Library Collection Distribution Formulas
devised by Donna Lee Kurkul

LCDF Operations: Descriptions of Operations
Examples and Explanations
Instructions for Operations
by Donna Lee Kurkul

LCDF OPERATIONS

LCDF OPERATIONS: Do you wish to see a description of this program? Y or N

If Y, display LCDF OPERATIONS description, part 1
If N, bypass LCDF operations description, part 2, and display menu of LCDF operations

*LCDF OPERATIONS description--PART 1

The LCDF--Library Collection Distribution Formulas--program is both an applications package and an instructional tool for determining the placement and calculating the distribution of book collections and book sequences in a library, prior to physical collection movement.

Collection movement: Do you wish to see a description? Y or N

If Y, display collection movement description and LCDF operations description, part 2
If N, display LCDF OPERATIONS description, part 2

*Collection movement description

In a library, the movements of a book collection, of book sequences, or of individual volumes within a collection are constant characteristics of stack management. Besides the normal movement due to book circulation and book returns for reshelving, several factors predetermine the forever changing configuration of book placement on shelves within sections within ranges.

A library's acquisitions rate, necessitating growth space, requires collection expansion. Withdrawal of obsolete materials and multiple copies, creating available space, requires collection compaction.

Collections of infrequently used books can be relegated to storage to create space, and, conversely, books in storage may be resurrected for collection integration, which demands space.

In libraries where books exist in two classification systems, books can be reclassified, leaving space vacant in one area and occupying space elsewhere.

Then again, construction may be undertaken, for additional space or better space utilization, and a collection in whole or parts may be moved into renovated or newly constructed areas of a library.

LCDF OPERATIONS description--PART 2

Before a collection, in whole or part, can be moved, certain data must be known and several steps must be followed via analysis of the existing collection.

The LCDF program offers one method of charting data on book stack shelves and book collections.

The LCDF program of steps, the MENU of LCDF OPERATIONS, includes the following aids under each of the four menu operations:

Description of the operation function
Example for screen display
Explanation of example on screen display
Instructions for operation

Each aid may be selected at the user's option, when the user selects and enters the number for an operation.

All aids compiled into the user manual are retrievable in printed hard copy at session's end. The user may also elect to print the reference-index to the program.

The user may also elect to store in an external file the charts of data on book stack shelves and book collections. If stored, the charts can be recalled for printing hardcopy.

All calculations performed under an operation are recorded.

This program has been tested and validated for its performance and accuracy in planning the placement and distribution of an actual library collection of 687,000 volumes, prior to movement. Copyright by Donna Lee Kurkul/Marielouise A. Hooper 1983. All rights reserved.

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OPERATION 1

1: Enter data for new book stack shelf configuration

New book stack shelf configuration: Do you wish to see a description? Y or N

If Y, display
If N, Do you wish to see example for screen display? Y or N
If N, bypass example and explanation, to instructions
If Y, display example; after display example, Do you wish to see the explanation of example on screen display? Y or N
If Y, display explanation, then to instructions
If N, Do you wish to see instructions for this operation? Y or N
If Y, display instructions for operation
If N, display operation

*New book stack shelf configuration

A book stack shelf configuration charts the count of available book stack shelves. This chart lists both the level and area (or area/subarea) counts of available shelves and the total numbers of available shelves at the number of shelves you designate per section.

Such a chart duplicates floor plans illustrating the physical layout of book stacks in a library building.

You must know how many available shelves you have and the locations of those shelves before you can figure where to place a collection of books.

*Example for screen display

COUNTS OF BOOK STACK SHELVES

Area	Shelves per area	Subarea	Number of Shelves
1	1500	1	1000
1	1500	2	500
2	1000	1	1000
2	1000	2	0

*Explanation of example

This example tells you that this library has two levels labeled "areas." Level 1 or Area 1 has two separate areas or "subareas," one area with 1000 shelves of books, and another area with 500 shelves, a total of 1500 shelves. Level 2 or Area 2 has one area of book stacks and 1000 shelves.

*Instructions for data collection to enter in new book stack shelf configuration

To enter data for the book stack shelf configuration chart, you must know how many levels or areas of the library have book stacks with shelves to contain books. Next, how many subareas in an area? Finally, how many shelves are available in each subarea?

Calculate the number of shelves available as follows:

Multiply the numbers of shelves designated per section times the number of sections per range, times the number of ranges per subarea.

(shelves per section x sections per range x ranges per subarea) = (number of shelves per subarea)

*Example

If you have 5 shelves per section and 10 sections per range and 20 ranges in a subarea, then there are 1000 available shelves in the subarea.

This preliminary figuring precedes the entering of data into a chart for the numbers of available shelves by area and subarea. If your library has such data on record, but it is designated at 7 shelves per section, then you would create a new chart to reflect the book stack areas being converted to an 8-shelf section standard.

*Instructions for operation

The operations to enter data for new book stack shelf configuration require that you type in the numbers for the following:

Enter number of areas=_____
Enter number of subareas=_____
Enter number of shelves in following chart

..Area....Subarea...NUMBER OF SHELVES

Do you wish to display entire chart configuration? Y or N

The new book stack shelf configuration chart will automatically be available for display in LCDF operations 3 and 4.

When the chart is completed, you must indicate Y or N (yes or no) if you wish to store this information in an external file for recall in printed hardcopy at the end of this session.

If you wish to revise the chart, you must indicate Y or N.
You then type in revisions for:

Area....Subarea...Number of shelves

You may revise as few or as many area/subarea/numbers of shelves as you wish. The program will automatically create a revised chart and retain original data input.

OPERATION 2

2: Enter data for current book stack shelf configuration

Current book stack shelf configuration: Do you wish to see a description? Y or N

*Current book stack shelf configuration

A current book stack shelf configuration charts the current call number sequences of the collection(s) located in each subarea of the areas or levels of the library, as well as the number of shelves occupied by each sequence and the total number of shelves in each area. An occupied shelf as used here means a shelf with books on it.

*Example for screen display

COUNTS OF OCCUPIED BOOK STACK SHELVES

Area	Shelves per Area	Subarea	Shelves per Subarea	Collection
1	600	1	500	DDC 800-899
1	600	2	100	ref/per/nwspr
2	500	1	500	000-799/900-999
2	500	2	0	

*Explanation of example

This example tells you that this library has two levels. Level or AREA 1 has two separate areas of book stacks, one with 500 occupied shelves of fiction classed in the Dewey Decimal system, another with 100 shelves of reference books, periodicals, and newspapers, a total of 600 occupied shelves. AREA 2 has two subareas, one of which has book stacks with 500 shelves occupied by nonfiction classified in Dewey.

*Instructions for data collection to enter in current book stack shelf configuration

To enter data for the current book stack shelf configuration chart, you must count or calculate the numbers of shelves occupied with books. You must also know what type of collection occupies each area of occupied shelves.

If an area is occupied shelf-by-shelf, then you can calculate as follows:

(shelves per section x sections per range x ranges per subarea)= number of occupied shelves per subarea

If some shelves are empty, say, if books in a closed collection have been withdrawn or reclassified, or if there are empty sections between sections occupied with books, and you wish to consolidate when you move the collection, physically count the number of shelves containing books.

If two shelves are half-filled with books, they can be counted as one if you are compacting the collection during a move. Since you are walking through the ranges of shelves while counting occupied shelves, this would be the time to mark, perhaps with colored tape, those shelves which you will consolidate.

If you are counting shelves of occupied books in a growing monograph collection, mark shelves or note call numbers for series for which extra numbers of shelves should be left empty for growth space. The empty shelves needed for growth should be counted as occupied shelves prior to a move.

Libraries differ in their shelving arrangements for materials. Some libraries integrate monographs, periodicals, reserves, reference, folio, etc.,; some segregate each collection type into areas unto themselves. The arrangement of the collection affects counting the numbers of occupied shelves, the numbers of shelves needed per section in a future arrangement, and the numbers of shelves for growth space.

Periodicals are not uniform in height, width, or depth, and require careful calculation for space requirements and individual shelf adjustment for each bound set of a title moving into a section.

The varying heights of bound periodicals may need five, six, or seven shelves adjusted to fit within the floor-to-ceiling height of the book stack sections. Some libraries with tall ceilings have book stack shelf capacity nine shelves high; some have eight; many have a standard seven-shelf book stack capacity.

If you are counting shelves occupied with bound periodicals, each title should be dealt with separately.

Calculate the shelf-space needed per title as follows:

(shelves occupied by title + number empty shelves per number years growth)= number shelves required per title

The standard height between shelves in a book stack section is approximately 28 cm.

If you figured that each subarea of available has seven shelves per section per range, then it is simpler to say that a periodical title occupies seven shelves' worth of space and physically occupies six shelves in the section.

*Instructions for operation, step 1

The operations to enter data for current book stack configuration require that you type in the numbers for:

Please enter number of collection/sequences*_____
Collection names can be up to 10 characters long.
Use the corresponding key to refer to a collection.

*Example key for collection/sequences--LCDF operation 2, step 1

KEY	Collection (or sequence)
1	DDC 800-899
2	000-799/900-999
3	ref/per/nwspr

*Explanation of collection key

This collection key tells you that this library has three distinct areas in which are located Dewey fiction; Dewey nonfiction; and reference, periodicals, and newspapers.

The collection key will permit entry for up to 200 separate collection/sequence entries for labeling the AREAS and subareas of occupied shelves by collection type.

If you do not use the key, the current book stack configuration chart can still be compiled, but without displaying what collection occupies the numbers of subareas shelves per AREA.

*Instructions for operation, step 2

Type in numbers for the following:

Enter number of areas=____
Enter number of subareas=_____
Enter number of shelves in the following chart

..Area....Subarea...NUMBER OF SHELVES

___ ___ ___

Collection Key = ___

___ ___ ___

Collection Key = ___

___ ___ ___

Collection Key = ___

Do you wish to display entire chart configuration? Y or N

By referring to the collection key used in the example for step 1 of this operation, you have provided the program with the information to create the chart for the counts of occupied book stack shelves, labeled by collection/sequence.

*Example for screen display: Do you wish to see again? Y or N

The current book stack shelf configuration charting the counts of occupied shelves of collections/sequences will automatically be stored and available for screen display in LCDF operations 3 and 4.

When the chart is completed you must indicate Y or N if you wish to store this information in an external file for recall in printed hardcopy at the end of this session.

If you wish to revise the chart, you must indicate Y or N. You then type in revisions for:

Area....Subarea...Number of shelves

You may revise as few or as many Area/Subarea/Numbers of shelves as you wish. The program will automatically create a revised chart and retain original input data.

OPERATION 3

3: Perform feasibility of options study

Feasibility of options study: Do you wish to see a description?

*A feasibility of options study qualifies or disqualifies the optional placement of collections for spatial accommodation in different levels, or AREAS, and subareas, of a library building.

The study involves the comparison of answers to what areas under consideration will provide the most efficient use of space? what percentage of that space would be occupied? what percentage of the space would be unoccupied? and if occupied, how many inches must be ideally filled per shelf in order that all shelves are occupied with some books?

The nature or type of collection must also be considered. Studying the feasibility of options for collection placement precedes the decision for where to place a collection(s) of books.

*Example for screen display

Number of shelves occupied by collection/sequence=11989
Number of shelves available in area/subarea=17801
Length of shelves in inches--standard shelves are 36 inches long, 35 inches of usable space=35

67.35% of the shelves would be occupied
32.65% of shelf space would be unoccupied
23.57 inches per shelf would be filled

*Explanation of example

This example is for a closed, nongrowing collection of 11989 shelves of books classified in the Dewey Decimal system and considered for placement in two areas which have a combined total of 17801 available shelves. Placement of the collection in these areas under consideration would mean occupying only 67.35% of available space. To occupy the other 32.65% of shelf space, 23.57 inches per 35-inch shelf would have to be filled to occupy 67.35% of space on each shelf. The latter would entail spreading out a closed collection, and, if materials are being withdrawn or reclassified, a shrinking collection.

Do you wish to see another example? Y or N

*Example for screen display

Number of shelves occupied by collection/sequence=4334
Number of shelves available in area/subarea=9129
Length of shelves in inches--standard shelves are 36 inches long, 35 inches of usable space=35

47.52% of the shelves would be occupied
52.48% of shelf space would be unoccupied
16.63 inches per shelf would be filled

*Explanation of example

This example is for a growing monograph collection of 4334 nearly full 35-inch shelves of books classified in Library of Congress and considered for placement in two areas which have a combined total of 9121 available shelves. If the current collection of nearly full shelves was distributed to occupy the area under consideration, 47.52% of the shelves or 16.63 inches per shelf would ideally be filled.

This library must decide if the 52.48% of unoccupied shelf space will provide enough growth space for their monograph collection, given the library's acquisitions rate. Could the collection remain in the area under consideration for a reasonably long time or will it need to be moved within so many years?

Do you wish to see a combined analysis of these two examples? Y or N

*Combined analysis of examples

Comprising a library's collection are the Dewey collection in example one and the Library of Congress monograph collection in example two. Each collection was considered for placement in the areas represented by the numbers of available shelves in each example.

However, the collection can also be considered for placement in several other combinations of areas in the newly constructed additions and renovations to this library. Repetition of data input for other areas of available shelves into which the collections could be placed displayed a more desirable alternative opting a maximum long-term plan for collection placement.

This option resulted in 93.45% of the shelves to be occupied by the Dewey collection and a 24.97% or 8.74 inches per shelf to be ideally occupied by the LC collection, instead of the 47.52% for the LC in example two. This means a more desirable three-quarters-empty shelves for acquisitions growth space for the LC monograph collection. This option was chosen by the library, since it provided the most efficient use of space for the collection types, given their characteristics.

*Instructions for feasibility of options study

To perform a feasibility of options study, you must know the numbers of available book stack shelves by level or AREA and subarea; the numbers of occupied shelves by level or AREA and subarea and by collection type; and, lastly, the length in inches for the book stack shelves in the available areas.

The instructions for obtaining and charting this data are shown in operations 1 and 2 of this program.

If you performed operations 1 and 2 for charting data, the feasibility of options study operation will automatically display the new book stack shelf configuration and the current book stack shelf configuration if you enter the number for the desired operation, 1 or 2, for chart display.

If you chose to store the charts in an external file, you could recall them for printed hard copy at the end of this session.

*Instructions for operation

The operations to perform a feasibility of options study require that you type in the numbers for:

Number of shelves occupied by collection/sequence=____
Number of shelves available in area/subarea=_____
Length of shelves in inches--standard shelves are 36 inches long, 35 inches of usable space=_____

With this information, the program will calculate for you answers to:

____percentage of shelves would be occupied
____percentage of shelf space would be unoccupied
____inches per shelf would be filled

Repeat entering data for each collection of shelves optionally considered for its placement in areas with x number of available shelves.

You must decide which option to choose for your library, given the building layout and the type and nature of collections to be moved and distributed for placement throughout the library building. This decision should opt for the most efficient space utilization. This decision also precedes deciding what sequences of each collection to designate for the subarea of the levels or AREAS into which the collection is going.

OPERATION 4

4: Calculate collection sequence placement

Calculating collection sequence placement: Do you wish to see a description? Y or N

*Calculating collection sequence placement means determining divisions of the collection's call number sequences for distribution and placement in the subareas of the area(s) in which you have chosen to move and place the collection. The nature or type of collection determines the calculation process needed to figure what portion and numbers of shelves comprising a sequence of a collection is to be accommodated in each subarea.

Distribution of book sequences ideally requires even call number and subject divisions between building areas and subareas, as well as maintaining an average percentage of collection growth space per sequence per subarea.

To calculate collection placement you must first know the number of available shelves in a subarea (LCDF operation 1); next, the number of shelves currently occupied by the collection (LCDF operation 2); and, lastly, the total number of shelves into which the collection is going (LCDF operation 3).

This data will finally guide the selection of the actual numbers of shelves for the sequences designated for subareas, in addition to providing the actual number of inches to fill per shelf per subarea and the percentage of actual growth space for each sequence per area.

*Example for screen display-LCDF operation 4, suboperation 3, step 1

Determine ideal percentage of shelf space to be occupied in an area subarea by a collection

Number of available shelves in a subarea=1701
Total number of shelves into which collection is going=17355

9.8% of the collection will occupy the subarea
9.8% of the total shelf space will be used

Determine the ideal number of shelves which should actually be filled

Enter total number of shelves occupied by the collection=4334

424.78 shelves of the 1701 shelves of the subarea should be ideally filled

*Explanation of example for step 1

This example tells you that 9.8% of the collection will occupy the subarea with 1701 available shelves of the total number of 17355 available shelves into which the collection is going. The collection occupies 4334 shelves, 424.78 of which should be ideally filled in the area of 1701 shelves.

This example is for a growing collection of 4334 occupied shelves of monographs classified in the Library of Congress system. The collection is to be expanded into two areas or building levels which have a combined total of 17355 available shelves, an area about three times the area occupied by the collection.

Nine subareas with varying numbers of available shelves per area comprise the two areas or building levels containing the total 17355 available shelves into which the collection is being distributed.

Step 1 of this operation should be repeated for each of those nine areas to obtain the ideal numbers of shelves which should actually be filled to evenly distribute percentages of the collection throughout the nine areas.

*Instructions for calculating collection sequence placement, step 1

To perform the first step in calculating collection sequence placement, you must have the following information:

new book stack shelf configuration chart
current book stack shelf configuration chart

The new book stack shelf configuration charts the numbers of available book stack shelves by area and subarea.

The current book stack shelf configuration charts the numbers of occupied shelves by area and subarea and by collection type/sequence.

The instructions for obtaining and charting this data are shown in operations 1 and 2 of this program.

If you performed operations 1 and 2 for charting the data, the calculation of collection sequence placement operation will automatically display the new book stack shelf configuration and the current book stack shelf configuration if you enter the number for the desired operation, 1 or 2, for chart display.

If you chose to store the charts in an external file, you could recall them for printed hardcopy at this session's end.

*Instructions for operation, step 1

The operations to calculate collection placement require that you type in the numbers for:

Number of available shelves in a subarea____
Total number of shelves into which collection is going=_____

Enter total number of shelves occupied by collection=_____

With this information, the program will calculate for you answers to:
____percentage of the collection will occupy the subarea
____percentage of the total shelf space will be used
____shelves of the_____ shelves of the subarea should be ideally filled

To retain this information for your reference, all calculations performed are stored and may be retrieved for printed copy at the end of this session.

*Example for screen display--LCDF operation 4, suboperation 3, step 2

Determine the actual percentage of growth space for the sequence going into the area

Enter actual number of shelves occupied by sequence division=494

The growth space for this sequence is 70.96%

Determine the number of inches to fill per shelf for the sequence going into this area

Number of inches occupied by sequence going into the area=15080
Number of shelves per subarea (this may be an amended count)=1160

13.00 inches per shelf should be filled

*Explanation of example for step 2

This example tells you that for the 494 occupied shelves for the sequence chosen for the area of 1160 shelves, the growth space is 70.96%.

*Instructions to count actual number of shelves for distribution of sequences into areas

*Example as applied to suboperation 3, steps 1 and 2, of LCDF operation 4

Step 1 told you that 424.78 shelves of the area of 1701 shelves of the subarea should ideally be filled.

The library decided to place the beginning of the sequence, class A, in the subarea with 1701 available shelves. The remainder of the sequences would follow logically from one end of the building to the other end on each of the two areas of two building levels for which the combined total of available subarea shelves equals 17355.

Using the figure of 424.78 ideal shelves, the physical shelf counting proceeded.

Counting forward into LC sequence class A, to begin in the area of 1701 shelves, it was found that LC sequence A had only 102 shelves; the counting continued through sequence class B. LC sequence classes A through B had 494 occupied shelves, 70 over the ideal 424.78 to be ideally filled.

This collection of LC monographs was chosen for placement on the two levels with nine subareas because it afforded nearly 75% growth space, since the collection would occupy 24.97% of total area space.

Step 2 told you that for the 494 shelves actually occupied, instead of the 424.78 ideal number of shelves for placement, the growth space for the sequence would be 70.96%.

Using the figures for the ideal numbers of shelves to fill in the other eight subareas, as obtained in repetition of step 1, and counting the actual number of shelves for each LC sequence for each subarea, the average growth capacity throughout the nine subareas ranged between 70.95% and 74.38%. This growth percentage range was equivalent to near 75% growth for the LC monographs projected in the second feasibility of options study the library performed to determine which area(s) of their building would provide optimum space requirements for the collection(s).

With as little as 30% of a shelf being occupied throughout the nine areas of sequence distribution, a collective decision promoting convenient patron access determined that only five shelves per seven-shelf section would be occupied by the LC monograph collection. An amended count of shelves at five per section minus the space for shelving areas was added to the new book stack shelf configuration chart. Therefore, instead of 1701 available shelves for this subarea, 1160 available shelves were entered in step 2 of this operation.

*Instructions to obtain the actual number of inches to fill per shelf per area

For edification of the inexperienced in collection movement, too few or too many inches of space filled per thousands of shelves leads to chaos: either too much space and no books left to fill it or no space and books left over. Also, books are continuously charged out and reshelved.

To avoid miscalculation, all sequences to be distributed throughout subareas should be measured a day or two prior to movement. Use a yardstick and measure accurately each shelf for the number of actual inches occupied for the sequence to be moved. Add the total number of inches.

Measuring shelves for the number of occupied inches requires two people for two hours for about 1200 shelves of books.

You need to know the number of inches and the number of shelves to be occupied to determine the number of inches to fill per shelf per subarea when you physically move and relocate sequences of the collection.

*Instructions for operation, step 2

Type in numbers for the following:

Enter actual number of shelves occupied by sequence division_____
Number of inches occupied by sequence going into area_____
Number of shelves per subarea (this may be an amended count)_____

With this information, the program will calculate for you answers to the following:

_____percentage of growth space for this sequence
_____inches per shelf should be filled

Evaluation of original proposal for seminar paper

The proposal for this project in the Information Environment Seminar, "The feasibility of computer-assisted collection movement planning," was entirely accurate in its purpose, results, and method to produce a program for library collection distribution formulas.

Not only has the software been developed, but, also, the software is both an applications package for librarians to plan collection placement, and an instructional tool for students to learn about determining and calculating collection placement prior to collection movement.

The effectiveness of the program's capability and applicability has been validated to implement the same methodology and to produce the same calculation results obtained manually for planning the collection placement and collection distribution of an academic library's 682,810 volumes prior to its movement.

The efficiency of the program's dynamics are obvious. The computer can instantly and infallibly produce and record results to calculations which would require at least ten to fifteen minutes to manually perform, verify, and record. The program's capability for automatic charting and revision of charted data eliminates both format and typing time for the planner. The printed copy of charts and calculation results standardize data for more effective presentation.

Post-program evaluation of job description for programmer

The job description written for the recruitment of a likely candidate both to program the library collection distribution formulas, and to tutor me in the language and structure of programming in Pascal, reflects my position as novitiate in the computer programming world. Were the job description rewritten after program completion, several parts would necessitate revision.

First, Easygraph would not accommodate the nature of charting data; Pascal could serve this purpose. My understanding of Easygraph was incorrect and my understanding of Pascal's capability was limited. Secondly, floor plans were not to be part of this program.

As for the wage and time schedules, both were inaccurate. No one would write a program for minimum wage; most free-lance programmers demand ten to fifteen dollars per hour. Although the program writing was accomplished in approximately twenty hours, it was naive not to realize the time required to evaluate program rewrites and modifications; to understand and use the actual written and working program; and, finally, naive not to consider the complexities in writing a user manual for the program.

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